CONSOLIDATED INFORMATION TECHNOLOGY SERVICES
TASK ASSIGNMENT (TA)

1. **TITLE:** (D211) Data Vis & Analysis Lab (DVAL) Support
Maintenance Under Existing Task RFC025 - Advanced Engineering Environments Branch Lab Operations

SubTask No:	RFC025.02-Rev4	**SubTask Internal Control No:**	NONE
Task Area Monitor:	**Alternate Task Area Monitor:**		
NASA POC:			
Software Control Class:	LOW CONTROL	**Priority Level:**	ROUTINE
Type of Task:	Non-Recurring Task		

2. BACKGROUND

The DVAL is organized as a central, open shop resource available to meet the data analysis and scientific visualization needs of the LaRC research community. The capabilities within the DVAL include development of immersive, collaborative virtual environments; flow feature extraction techniques; visualization systems for generating computer visualizations, both stills and animations; methods for visual comparisons of experimental and computational datasets; and image/data reduction tools and techniques. In addition, the DVAL expertise includes software development capabilities to produce custom software tools tailored to the unique requirements of the customer. Application areas cover a wide variety of disciplines including computational fluid dynamics, computational structures, atmospheric modeling, remote sensing, materials science, and experimental fluid dynamics.

3. OBJECTIVE

Develop requested visualization products, data analysis products, or specialized software tools for image/data processing, visualization, and analysis applications.

Deliver contractor reports as requested, documenting the results of a data analysis or visualization analysis projects

Provide consultation and demonstrations as requested in the area of data visualization.

Evaluate new emerging technology related to data visualization and virtual environments as required.

4. MAINTENANCE REQUIREMENTS

None.

5. GENERAL IT SUPPORT SERVICES

Services Specified Through Exhibit A:
General IT services and system administration support for the hardware and software used in the DVAL are provided under a separate TA RFC001.

Exceptions and Additional Requirements:
The Contractor is under NO obligation to maintain software licenses, upgrade existing hardware, purchase new hardware, purchase new software or pay for any third party technical support for any out-of-warranty software or hardware. All such expenditures must be paid for by the TAM

General IT Support Services Performance Metrics

Performance Standard: Actual cost of completed work did not exceed estimates in the Task Plan.

Performance Metrics:

- Exceeds: actual cost at completion of task or fiscal year is more than 10% below estimated cost
- Meets: actual cost at completion of task or fiscal year is between estimated cost and 10% below estimated cost.
- Fails: actual cost at completion of task or fiscal year exceeds estimated cost.

Performance Standard: Task deliverables submitted on time.

Performance Metrics:

- Exceeds: Work completed ahead of schedule
- Meets: Work completed on time
- Fails: Work behind schedule and milestones are missed

Performance Standard: Task Plan documentation submittals are accurate and complete.

Performance Metrics:

- Exceeds: Error Free, complete, understandable, ready for publication or presentation.
- Meets: Minor errors that do not affect the use of the documentation or the meaning being conveyed.
- Fails: Major errors that make the documentation incomplete and/or not understandable. Documentation is not usable.

Performance Standard: All Task Plan deliverables are provided and meet all task requirements and acceptance criteria.

Performance Metrics:

- Exceeds: All deliverables meet all task requirements and are accepted by the customer with no problems reported.
- Meets: All deliverables meet all task requirements and are accepted after minor problems are reported and fixed.
- Fails: Any deliverable is completely rejected by the customer.

6. SYSTEM AND APPLICATION DEVELOPMENT SERVICES

Project Title: Community Noise Test Environment (CNoTE) and Aircraft Source Noise Generator (ASoNG)

LaRC Software Manager:

Software Software Control Class: Low

Responsibilities of Contractor and LaRC personnel:The Software Manager shall provide the Contractor with access to the following hardware in Bldg 1208: - Win32 development PC with existing CNoTE and ASoNG source code - AuSIM3D audio server. - Tablet PC with existing subjective test interface source code. - head-tracked, head mounted display with headphones and a wand The contractor shall track and report costs (hours) incurred in performing the work outlined in this section as separate subtasks in the weekly hour report.

Requirements:
The Structural Acoustics Branch is involved in research to assess and minimize community noise impact due to aircraft flight operations. The work is supported under the Subsonic Rotary Wing project of the Fundamental Aeronautics program. One aspect of this research is to assess community noise impact through subjective testing. As field tests are both expensive and problematic, aircraft flyover noise simulation is required. The existing CNoTE and ASoNG software provides an immersive acoustic-visual environment for presenting both synthesized and recorded aircraft sound to a listener on the ground for use in subjective testing environments. This TA describes an ongoing software development effort to improve the existing software by adding further functionality.

The contractor will work with LaRC personnel to add functionality to existing LaRC-developed software. Specifically, the contractor shall perform the following tasks related to CNoTE and ASoNG development:

1) Port the existing CNoTE simulation software from one based on SGI OpenGL Performer to one based on OpenSceneGraph. Verify and test operation of software on new graphics/audio platforms being installed during modifications to the Exterior Effects Room (EER) in Building 1208, Room 129.

2) Add visualization features to the CNoTE simulation software to simulate different weather, day/night and ground conditions.

3) Enhance the ASoNG synthesis software to include narrowband synthesis, buffered output to audio hardware, and live controller input.

Constraints:
All code shall be compatible with the current CNoTE and ASoNG software framework.

Acceptance Criteria:
The Contractor will demonstrate the added capabilities and enhancements made to this application to the LaRC Software Manager or specified representative. Errors or problems

observed will be recorded by the contractor and shall be corrected and tested before acceptance.

Deliverables:

Number	Deliverable Item	Deliverable Schedule
1	CNoTE and ASoNG Source Code and Documentation	December 31, 2008

Project Title: Subjective Testing Software & Hardware Upgrade

LaRC Software Manager:

Software Software Control Class: Low

Responsibilities of Contractor and LaRC personnel:The Software Manager shall provide the Contractor with access to the following hardware in Bldg 1208: - A development desktop PC with software licenses. - A Tablet PC with existing subjective test interface source code. - A SGI O2 computer with existing subjective testing codes. The contractor shall track and report costs (hours) incurred in performing the work outlined in this section as separate subtasks in the weekly hour report.

Requirements:

The Structural Acoustics Branch is involved in research to assess noise impact due to aircraft noise, including interior noise, flyover noise and sonic boom. The work is supported under the Supersonics project of the Fundamental Aeronautics program. One aspect of this research is to assess noise impact through subjective testing. A system exists at present, based on an SGI computer, that plays sonic booms or other sounds to listeners using a number of different psychoacoustical methodologies. This TA describes a software development effort to transfer the existing software, which comprises two programs, one for playing .aifc files and the other for playing in-house format files, from the SGI to a PC-based platform and to incorporate the use of a Tablet PC in collecting listeners responses. The contractor will support the SAB in this development.

The contractor shall work with LaRC personnel to modify and add functionality to existing LaRC-developed software. Specifically, the contractor shall perform the following tasks:

- Modify the present codes to function on a PC-based platform. This requires consideration of the PC hardware to be used, as it is a requirement that the hardware must function down to DC (zero frequency), as the sounds to be played contain energy down to very low frequencies. Data acquisition as well as playback must be taken into account.

- Add functionality to enable use of a Tablet PC to collect responses and display messages, using wireless connectivity. This functionality is similar to that previously developed for the CNoTe system.

Constraints:

a) All code shall be compatible with the current software framework.
b) Development is to be performed at the government facilities and on the government

furnished equipment indicated above.
c) All codes shall include required auxiliary files for building applications, e.g. makefiles and Visual Studio project files.

Acceptance Criteria:
With the Software Manager or her alternate observing, the contractor shall successfully demonstrate the requested software on the hardware listed below. Errors or problems observed will be recorded by the contractor and shall be corrected and tested before acceptance.

Deliverables:

Number	Deliverable Item	Deliverable Schedule
1	Updated PC-based source codes with fully integrated subjective response subsystem	December 31, 2008
2	Tablet PC client application source code(s)	December 31, 2008
3	Informal report documenting the code(s)	December 31, 2008

Project Title: Radiation Shielding Tools

LaRC Software Manager:

Software Software Control Class: Low

Responsibilities of Contractor and LaRC personnel:The Software Manager shall provide the Contractor with access to the following software and hardware: - Subversion (version control) repositories for access to existing source code and data. - User accounts on all necessary Linux workstations. The contractor shall track and report costs (hours) incurred in performing the work outlined in this section as separate subtasks in the weekly hour report.

Requirements:
The Radiation Shielding Team is a collaborative group of physicists, engineers, and software developers creating tools and techniques to allow for the analysis and design of future spacecraft. Their purpose is to minimize the effects of ionizing radiation on humans and electronics by computing the radiation environments and transporting the environment through various shielding materials in order to determine various response quantities effecting the humans and electronics. The team has already developed a website called OLTARIS (On-Line Tool for the Assessment of Radiation in Space), that allows users to access the available physics tools. This task will enhance and add to this activity.

The contractor will work with LaRC personnel and other contractors to add functionality to existing software. Specifically, the contractor shall perform the following tasks related to the radiation design tool development:

1) Create and keep up to date an automated testing system for the FORTRAN physics codes. The code is maintained in a Subversion repository and test scripts are developed by the physicist and engineers on the radiation tools team. The contractor shall develop or implement some testing environment that will automatically run the test cases and flag errors when they are found.

2) Design and develop a desktop interface for the radiation tools similar to the OLTARIS website, but with greater functionality enabled by the desktop environment, such as plotting and 3-D graphics. This task will be worked in close collaboration with the software manager and others on the radiation shielding team.

3) Support and expand as necessary the Flash-based plotting package used for the OLTARIS website.

Acceptance Criteria:
The Contractor will demonstrate the added capabilities and enhancements made to these applications to the LaRC Software Manager or specified representative. Errors or problems observed will be recorded by the contractor and shall be corrected and tested before acceptance. All updates to code will be saved in the appropriate Subversion repository.

Deliverables:

Number	Deliverable Item	Deliverable Schedule
1	Automated Testing System for FORTRAN	February 2008
2	Desktop Client interface	September 2008

7. WORK-AREA SPECIFIC SERVICES

Work Area Title: DVAL Direct User / Customer Support

LaRC Manager:

Work Area Description: The contractor shall provide data visualization and analysis services to the LaRC research community within the scope of the DVAL functions. Individual requirements will be defined by researchers who are authorized by the LaRC Manager to specify the required visualization products, data analysis products, or specialized software tools for image/data processing, visualization, and analysis applications. The LaRC Manager will coordinate and issue requests for direct user support, prioritize work, obtain funding, and approve the subtask plan developed by the contractor in response to the user's requirements. Visualization and data analysis products may include: stills, animations, and interactive visualizations and contractor reports documenting the results of a data analysis or visualization projects. Software development activities may include: interactive, user-friendly image data reduction software, feature extraction software, and visual data analysis tools. The contractor shall use the resources available in the Data Visualization and Analysis Lab, B1268, Room 1051 as needed. Building 1268 and DVAL is open from 6am to 6pm Monday through Fridays with the exception of Holidays. On rare occasion, weekend work or after hours work may be required. In this case the Contractor must have after hours access permission to be able to work in DVAL.

Work Area Requirements: The contractor shall make initial contact as requested by the LaRC manager. The contractor shall work with the customer to determine their requirements. For short consultation tasks or tasks requiring less than 40 working hours to complete, the contractor shall keep a log of these types of activities including the

customers name, organization, a brief description of the request and the hours needed to complete the request. For requests that are estimated to take more than 40 working hours to complete, the contractor shall develop a subtask plan within a week of receiving the user requirements. This subtask plan shall address the contractor's lead personnel, specific work plans, specific products to be delivered, and the associated estimated labor hours, cost, and schedule. Communications with the customer will be held via e-mail, telephone, and face to face meetings as needed with the contractors and the LaRC manager. At a minimum, the Contractor shall schedule and hold joint reviews with the customer regarding the task work when deliverables have been completed and are to be presented to the customer for acceptance. Any changes to the list of deliverables, schedule, or cost will be agreed to and authorized with a signed amendment to the subtask plan. The LaRC Manager will be responsible for resolving customer concerns related to quality, schedule, or cost of the service.

When all the task deliverables have been completed, accepted, and the time period necessary for refinements as agreed upon as part of the task requirements has passed, the contractor shall generate a task closing statement. The closing statement will be signed in the same manner as the task statement and amendments. Also the contractor shall request the customer to send an email recording his acceptance of individual deliverables throughout the course of the task.

The contractor shall track and report costs (hours) incurred in performing the work outlined in this section as separate subtasks in the weekly hour report.

8. Exhibit A

None required.

9. SPECIAL SECURITY REQUIREMENTS

UNCLASSIFIED unless otherwise specified by the customers utilizing the open shop laboratory. Data that is designated as limited exclusive rights distribution (LERD) or considered sensitive and/or proprietary will not be distributed to third parties without permission from the Requestor. ITAR restrictions will be marked and followed when directed by the appropriate program/project office or by the data owner. The contractor must have their own user account and password on the available computer systems.

10. SOFTWARE ENGINEERING PROCESS REQUIREMENTS

The contractor shall follow the processes for software life-cycle development, stand-alone maintenance, or stand-alone operation, as specified according to the software control class in Task Assignment # SL001.

11. JOINT REVIEW SCHEDULE

There will be a joint review of the work of this task at meetings to be held monthly. TAM,

other NASA employees, and the contractors working on this Task Assignment are required to attend. Technical performance, timeliness, and cost will be discussed. A technical demonstration by either the government or the Contractor may be included in the joint review.

12. PERIOD OF PERFORMANCE

This TA is effective from 02/01/08 to 04/27/09

13. TECHNICAL PERFORMANCE RATING

In evaluating Technical Performance, quality and timeliness shall be rated as follows:

Quality: 75% Timeliness: 25%

14. RESPONSE REQUIREMENTS

None required.

15. FUNDING INFORMATION

Funding last submitted on 06/16/2008.

16. MILESTONES

None required.

17. DELIVERABLES

None required.

18. FILE ATTACHMENTS

None.